

Overview: Activity One

The majority of the electricity used in the United States (U.S.) is produced from fossil fuels like coal, oil, and natural gas. When these fossil fuels are burned, air pollution is created in the form of carbon dioxide (CO₂), sulfur dioxide (SO₂) and nitrogen oxide (NO_x). In this activity, your students will be introduced to the relationship between reduced energy use and pollution prevention. Steps 1 and 2 of a 5-step home lighting energy-saver detective scientific investigation are covered in class and with a home lighting energy-saver detective worksheet.

Levels:

Grades 4-7

Subject:

Real-life applications of science, social studies, and mathematics

Concepts:

- Relationship between electricity, greenhouse gases, and global climate change
- Reducing the demand for electricity, which is mostly generated from fossil fuels, can slow global climate change, reduce acid rain, and diminish smog
- Students and their families can save money and help the environment by using light bulbs that need less energy

Skills:

Scientific investigation, observing, visual discrimination, estimating, adding

Objectives:

- Students will understand how to use a scientific investigation to make decisions that cut costs, save energy, and help the environment
- Students will complete steps 1 and 2 of the 5-step home lighting energy-saver detective scientific investigation

Materials:

- Energy and environment in-class instruction materials (pp. 17-26)
- Home Lighting Energy-Saver Detective Student Page Research: How much energy do my lights use? (p. 4)

Background

People in the U.S. waste an enormous amount of energy because they do not use readily available energy-efficient lighting, such as compact fluorescent lamps (CFL). These lights fit in many lighting fixtures and produce at least the same amount or more light with less energy. Using less energy reduces air pollution and saves money on family utility bills.

Getting Ready

- 1) Familiarize yourself with the introductory in-class instruction materials (pp. 17-26).
- 2) Make transparencies from pages 17 to 26 to introduce your class to the relationship between energy consumption and the environment.
- 3) Copy the worksheet "Research: How much energy do my lights use?"

Doing the First Activity

1. Use the transparencies you made from pages 17 to 20 to introduce your student to the environmental impacts of energy use.
2. Stimulate student interest in using less energy by asking them to point out energy saving opportunities in the transparency you made from page 21.

3. Use the transparencies from pages 22 to 26 and the other materials you gathered to introduce, discuss, and begin the Home Lighting Energy-Saver Detective scientific investigation.
4. Conclude the home lighting energy-saver detective introduction by handing out the worksheet "Research: How much energy do my lights use?" Explain that this science/social studies homework will be needed to complete the in-class exercises in their next science and math class (see figure 1.1).
5. Make sure the students understand the directions for page 4, particularly points a&b below:
 - a. Enter a 0 in the block if their home does not include a room listed on the worksheet.
 - b. Count each halogen torchiere (see Figure 1.2.) bulb three times because they use three times as much electricity as regular incandescent light bulbs.
6. Continue teaching the scientific investigation by proceeding to Activity two the next time this class meets.

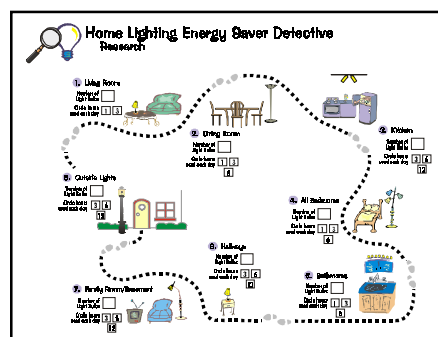


Figure 1.1.

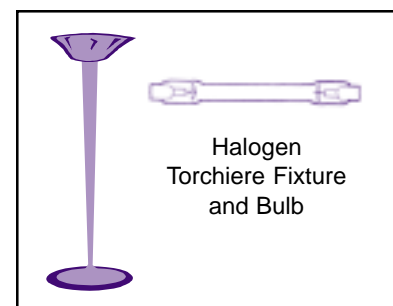


Figure 1.2.



Home Lighting Energy-Saver Detective Research: How much energy do my lights use?

Instructions: Search your home and count the number of light bulbs in each room. Count each halogen torchiere bulb three times (see light clue in "dining room") because these lights use three times as much energy as the other lights in your home. Circle the number that is closest to the amount of time the bulbs are used each day.

1. Living Room

Number of light bulbs

Circle hours used each day 1 3 6



2. Dining Room

Number of light bulbs

Circle hours used each day 1 3 6



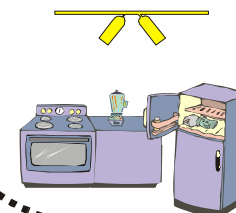
Clue

Halogen torchieres use three times as much energy as other lights. If you have this kind of lamp in your home, count it 3 times for this worksheet.

3. Kitchen

Number of light bulbs

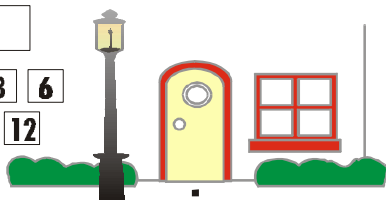
Circle hours used each day 3 6 12



8. Outside Lights

Number of light bulbs

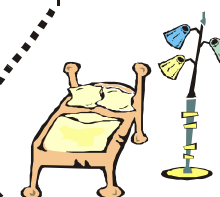
Circle hours used each day 3 6 12



4. All Bedrooms

Number of light bulbs

Circle hours used each day 1 3 6



6. Hallways

Number of light bulbs

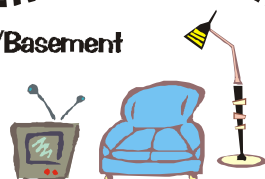
Circle hours used each day 3 6 12



7. Family Room/Basement

Number of light bulbs

Circle hours used each day 3 6 12



5. Bathrooms

Number of light bulbs

Circle hours used each day 1 3 6

